APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/069,088	04/29/1998	SHENG LIANG	06502.0129-0	3016

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EXAMINER
NGUYEN, VAN H

ART UNIT	PAPER NUMBER
2151	

DATE MAILED: 02/27/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

	Application No.		Applicant(s)	
Office Action Summary	09/069,088		SHENG LIANG	
	Examiner		**Art Unit**	
	VAN H NGUYEN		2151	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _13 November 2001_ .

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-25_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-25_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____ .

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
         application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4)☐ Interview Summary (PTO-413) Paper No(s). _____ .
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: .

DETAILED ACTION

1.   This Office Action is in response to the CPA filed on November 13, 2001. Claims 1-25

remain in this application.

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or
> described as set forth in section 102 of this title, if the differences between the subject
> matter sought to be patented and the prior art are such that the subject matter as a whole
> would have been obvious at the time the invention was made to a person having ordinary
> skill in the art to which said subject matter pertains. Patentability shall not be negatived
> by the manner in which the invention was made.

Claims 1-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Doing et al.**

(U.S.6,018,759- cited by the Examiner in paper #5) in view of **Rosenberg** "How Debuggers

Work: Algorithms, Data Structures, and Architecture", pages 95-106.

As to independent claims 1, 9, 17, and 25, Doing teaches time profiling (profile

performance of a software program; col.6, lines 42-48) multiple threads (multithreaded

processing, col.5, lines 34-35) of execution corresponding to a program:

- interrupting execution of the threads (when a first thread is suspended; col.9, lines 38-62)

- determining whether register data corresponding to a selected thread (thread state registers 440 comprise a state register for each thread; col.11, lines 46-5) has changed from a previous interrupt (the change of states; fig.5 and col.13, lines 5-59); and

- providing an indication of the change for the selected thread (indicates whether the change of state of a thread; col.12, lines 26-53).

Doing does teach "interrupting execution of the threads".

However, Doing does not explicitly teach "interrupting execution of all of the threads".

Rosenberg suggests the use of user breakpoint to suspend execution of all threads (user breakpoint...execution to stop...stops the process; page 100, lines 4-9).

It would have been obvious to combine the teachings of Rosenberg with Doing because it would have provided Doing' s system with the enhanced capability of facilitating time profiling in the multithreaded environment.

As to dependent claims 2, 10, and 18, Doing teaches accessing stored data corresponding to the selected thread; and comparing the stored data with register information stored following a previous interrupt (when a thread changes state...the thread switch algorithm continues to compare thread states between the threads; col.17, lines 31-57).

As to dependent claims 3, 11, and 19, Doing teaches computing a value corresponding to the stored data; and determining a relationship between the computed value and the previously

stored register information (setting a first time-out value in a first time-out register...resetting a first time-out counter; col.6, lines 15-42).

As to dependent claims 4, 12, and 20, Doing teaches updating a memory segment to reflect that the selected thread is running when it is determined that the computed value and the previously stored register information do not match (updating a memory page table; col.15, lines 45-65).

As to independent claims 5, 13, and 21, the rejection of claim 1, 9, 17, and 25 above is incorporated herein in full. However, claims 5, 13, and 21 further recites "retrieving register data corresponding to the selected thread".

Doing teaches retrieving register data corresponding to the selected thread (if the required data or instruction is in the L2 cache 130 and is retrieved...the state of the thread then returns to state 00, meaning ready for execution; col.13, lines 5-29).

As to dependent claims 6, 14, and 22, Doing teaches updating the previous register information based on the computed value (updating a memory page table; col.15, lines 45-65).

As to dependent claims 7, 15, and 23, Doing teaches providing an indication corresponding to a portion of the program containing the selected thread (indicate the state of the threads; col.17, lines 15-30).

As to independent claims 8, 16, and 24, the rejection of claim 1, 9, 17, and 25 above is incorporated herein in full. However, claims 8, 16, and 24 recite:

- determining whether stored information corresponding to processor registers for each

thread indicates that the thread is running by comparing the information to stored information

from a previous interrupt; and

- recording time-profiling information for each running thread.

Doing teaches:

- determining whether stored information corresponding to processor registers (a

processor includes two registers; col.6, lines 49-50) for each thread indicates that the thread is

running by comparing the information to stored information from a previous interrupt (when a

thread changes state...the thread switch algorithm continues to compare thread states between the

threads; col.17, lines 31-57); and

- recording time-profiling information for each running thread (the monitor 700 records

the values...along with the corresponding values of the thread switch time-out; col.23, lines 9-

40).

Response to Arguments

3.   Applicants' arguments with respect to claims 1-25 have been considered but are moot in

view of the new ground(s) rejection.

Applicants arguments presented issued which required the Examiner to further view the

previous rejection. The Examiner conducted a further search regarding the issues mentioned in

Applicant's response. Therefore, all arguments regarding the cited references of the previous

rejection are moot in view of the new grounds of rejection.

Conclusion

Prior Art not relied upon:
Please refer to the references listed on the attached PTO-892 which are not relied upon in the
claim rejections detailed above.

Objective - Reducing and Simplifying the areas of disagreement:
· The Examiner solicits Applicant's cooperation in reducing and simplifying the areas of
disagreement by doing the following: 1) amending the independent claims in a manner fully
supported by the specification to clearly distinguish over the prior art of record, AND/OR 2)
directing clear and concise arguments to the specific claim language and claim elements that
Applicant believes are not fairly taught nor suggested by the cited prior art of record. Applicant
should cancel claims where appropriate. Applicant should preferably avoid arguing general
differences between the cited references and the instant invention as disclosed in the
specification. Your cooperation is appreciated.

· M.P.E.P. 2001.06(b) Information Relating to or from Copending United States
Patent Applications
The individuals covered by 37 CFR 1.56 have a duty to bring to the attention of
the examiner, or other Office official involved with the examination of a particular

application, information within their knowledge as to other copending United
States applications which are "material to patentability" of the application in
Question, as set forth by the Court in Armour & Co. v. Swift & Co. ,175 USPQ
70, 79 (7th Cir. 1972).

Format of Amended Claims pursuant to 37 C.F.R. 1.121:

37 CFR § 1.121 amendments were optional on November 7, 2000 and became mandatory on
March 1, 2001.

· Please help expedite the prosecution of this application by including a clean set of all pending
claims, consolidating all previous versions of pending claims from a series of separate
amendments into a single clean version in a single amendment paper. This submission of a clean
version of all of the pending claims will be construed as directing the cancellation of all previous
versions of any pending claims. No marked-up version will be required to accompany the clean
version where no changes other than the consolidation are being made. 37 CFR § 1.121.

For details of the PBG final rules please refer to the following PTO website:
http://www.uspto.gov/web/offices/dcom/olia/pbg/index.html

Please verify the CORRECT SERIAL NUMBER in all responses:
· All incoming papers received by the PTO are matched with the application file by application
serial number. Failure to include a correct application serial number on PTO correspondence
will result in significant processing delays. The use of the correct PTO application serial number
is required on all future correspondence.

Please verify your CORRECT MAILING ADDRESS:
· If your mailing address changes after the filing of the instant application you must promptly
notify the PTO of your CHANGE OF ADDRESS to prevent PTO correspondence being returned
by the Post Office as undeliverable.

How to Contact the Examiner:
- Any inquiry concerning this communication or earlier communications from the Examiner
should be directed to Van H. Nguyen whose voice telephone number is (703) 306-5971. A voice
mail service is also available at this number.

- All responses sent by U.S. Mail should be mailed to:
         Commissioner of Patents and Trademarks
         Washington, D.C. 20231

- Hand-delivered responses should be brought to Crystal Park Two, 2021 Crystal Drive, Arlington. VA., Sixth Floor (Receptionist). All hand-delivered responses will be handled and entered by the docketing personnel. Please do not hand deliver responses directly to the Examiner.

IMPORTANT CHANGE IN PTO FAX POLICY:
- AFTER-FINAL faxes must be signed and sent to: (703) 746-7238.
- OFFICIAL faxes must be signed and sent to: (703) 746-7239.
- NON OFFICIAL faxes should not be signed, please send to: (703) 746-7240, or to Examiner Courtenay's desktop computer at 703-746-5475.

> **All OFFICIAL faxes will be handled and entered by the docketing personnel. The date of entry will correspond to the actual FAX reception date unless that date is a Saturday, Sunday, or a Federal Holiday within the District of Columbia, in which case the official date of receipt will be the next business day. The application file will be promptly forwarded to the Examiner unless the application file must be sent to another area of the Office, e.g., Finance Division for fee charging, etc.**

To avoid ongoing Washington D.C. area mail processing delays, the Examiner requests that Applicant direct all communications to the PTO by fax. All incoming faxes are securely stored on PTO computers that are dedicated to fax reception. If you send a fax, please **do not** send duplicate papers via U.S. mail.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: (703) 305-3900.

Please direct inquiries regarding fees, paper matching, and other issues not involving the Examiner to TC 2100 CUSTOMER SERVICE: 703 306-5631.

02/22/02
Van H. Nguyen
Patent Examiner-AU#2151

ST. JOHN COURTENAY III
PRIMARY EXAMINER